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FUTURE-READY STATIONS!

CW's journey through the redevelopment of railway stations uncovers design trends, and is loaded with advice for prospective bidders!

No less than 1,337 railway stations across India are proposed to be redeveloped under the Amrit Bharat Station Scheme. These redesign and redevelopment projects will upgrade amenities for train travellers, introducing passenger-friendly features such as barrier-free movement, seamless multimodal connectivity and smart, digital infrastructure. They will also make stations more sustainable, by

incorporating renewable energy sources, energy-reducing passive design principles, and scalable, modular and adaptable designs. In all this, seamless urban integration is a priority. Essentially, the goal is to create future-ready transit hubs that also reflect regional architectural identities so as to merge into the cityscape, and be so well designed that they become tomorrow's urban landmarks.

So far, tenders have been awarded and work has commenced in 1,198 railway stations. But the scale of redevelopment per station differs enormously. Thus, whereas Begumpet is getting new mobility solutions (escalators and lifts) and amenities such as a waiting area, a new ticket booking window and parking at a cost of ₹26.55 crore, Ahmedabad (Kalupur) station is getting new multilevel parking, road



Photo courtesy: Wikipedia/ Sir M. Visvesvaraya Terminal, Bangalore (Terminal outside view) Santosh418

QUICK BYTES

- 1,337 stations set for redevelopment under Amrit Bharat Station Scheme.
- 1,198 stations – tenders awarded, work in progress.
- 6 stations – commissioned.
- 960+ stations solarised, enhancing self-sufficiency and national solar goals
- 100+ stations under CII's Green Rating initiative; 41 + certified



"A rating can deliver, at the most, a 40 per cent decline in the consumption of electricity and a 30 per cent decline in the water consumed in stations."

- **Saurav Choudhury**, Counsellor - Green Built Environment, Architect & Urban Planner, CII-IGBC

connectivity, a new concourse and other amenities costing ₹2,383 crore. Six redeveloped railway stations have been commissioned so far.

"A thorough site analysis helps assess geography, infrastructure

and transportation networks, identifying potential challenges and opportunities," says **Rajesh Chaabra**, Executive Director, Transportation, Egis South Asia. "Extensive stakeholder consultations with local authorities, transportation operators and the community ensure that the design meets both current and future needs. Optimising layouts for smooth passenger flow, efficient space usage and seamless user experiences, with particular attention to accessibility features, are a key priority."

CW identifies trending features of India's upcoming world-class terminals that promise to transform rail passenger experiences.

Mixed-use development

One of the biggest shifts we are



"Self-cleaning façades made of anti-smog tiles and kinetic

paving may play a role in next-generation stations."

- **Prof Charanjit S Shah**, Founder & Principal, Creative Group

observing is the move toward transit-oriented and mixed-use developments, making stations more than just transit hubs by integrating retail, commercial, and public spaces, according to **Nishant Prakhar**, Senior Architect & City Planner, GPM Architects & Planners.

Such high-density development around the station, in turn, reduces urban sprawl and promotes walkability. "The goal is to transform railway stations into self-sustaining urban nodes, reducing dependency on standalone transport functions and encouraging economic activity," points out **Dikshu Kukreja**, Managing Principal, CP Kukreja Architects, citing Gomti Nagar Lucknow Railway Station, which is strategically located in a commercial district, as a good example of a station where integrating mixed-use functions would enhance connectivity and urban vitality.

The decision to redesign a station as a mixed-use development or as a pure transit hub must be based on a careful analysis of the passenger traffic, the surrounding urban fabric (location), commercial viability and future growth projections. In that context, Prakhar says, "stations sitting in the heart of a bustling city or a growing economic corridor are particularly suited for redesign as a

COVER STORY



Photo courtesy: Gandhinagar Capital/Railway Board

Gandhinagar Railway Station, redeveloped under a PPP model, features a landmark five-star hotel above it.

mixed-use destination that will catalyse urban regeneration.”

A step further, “daily commuter volumes and peak-hour analysis help determine the scale of commercial activity required, and the long distance versus local commuter ratio will help determine the station’s need for amenities like hotels, business lounges and coworking spaces,” explains **Prof Charanjit S Shah, Founder & Principal, Creative Group.** “Dwell time and behavioural studies inform the type of commercial offerings.”

In major metropolitan areas such as Delhi, Mumbai and Bengaluru, where land is scarce and commuter traffic is high, integrating commercial spaces, offices and hotels within the station complex optimises land use. In such high-density urban cores, Shah proposes prioritising vertical development, incorporating multistorey retail and office spaces above concourses.



- **Nishant Prakhar, Senior Architect & City Planner, GPM Architects & Planners**

“Segregating arrival and departure areas avoids conflicts in passenger movement.”

If a station is in a rapidly urbanising area, incorporating retail and business zones can stimulate local economies. “In expanding suburban areas, railway land banks can be leveraged for integrated townships or logistics hubs,” says Shah. In Tier-2 and Tier-3 cities, stations often serve as economic hubs.

For instance, the Ahmedabad Railway Station redevelopment includes commercial and office spaces to cater to its high-volume

passenger flow, integrating retail with transit.

Yesvantpur Railway Station in Bengaluru, a key transit hub in a rapidly growing metropolis, is also being redeveloped into a world-class facility while maximising its commercial potential. “We’ve introduced state-of-the-art passenger amenities, retail spaces and food courts,” shares Prakhar.

Heritage stations can also gain from mixed-use development, suggests Shah. “Despite constraints, they can still incorporate the adaptive reuse of old structures for boutique retail, cultural centres or hospitality.” For instance, the Habibganj (Rani Kamalapati) Railway Station in Bhopal has been developed with commercial spaces, food courts and premium lounges while maintaining operational efficiency.

However, Shah cautions against blatant, intrusive commercial

COVER STORY



Photo courtesy: Gandhinagar Capital/Railway Board

Stations at the heart of bustling cities or economic corridors thrive as mixed-use hubs, driving urban regeneration.

integration if the station holds historical significance such as Howrah Station or Chennai Central. "In stations with lower passenger density, standalone redevelopment focused on basic amenities may be more practical," he says. "And stations near ecologically fragile zones such as hill stations and coastal belts should prioritise low-impact development over large commercial projects."

Multimodal integration

Multimodal integration is an important factor correlated to the feasibility of mixed-use projects, as it ensures higher footfall throughout the day. Shah cites Mumbai's Chhatrapati Shivaji Maharaj Terminus as a good example.

At the Andheri Railway Station, a critical suburban hub in Mumbai, which is being redeveloped into a 'railopolis', a mini smart city, decongesting passenger movement while improving connectivity



Photo courtesy: Railway Jammu Project

Passive lighting design strategies, such as the use of glazed façades, reduce dependency on artificial lighting and improve commuter comfort.



stations are being reimagined."

- Vipul B Varshneya, Co-Founder, Sthapati

between platforms and the metro station was a key focus. "A major intervention was the expansion of foot overbridges and skywalks, which provided direct connectivity to



"Design and execution complexities are among the biggest challenges in implementing railway station projects."

- Khoobi Mehta, Executive Director, Girdhari Lal Constructions

metro services, reducing ground-level bottlenecks," says Vipul B Varshneya, Co-founder, Sthapati.

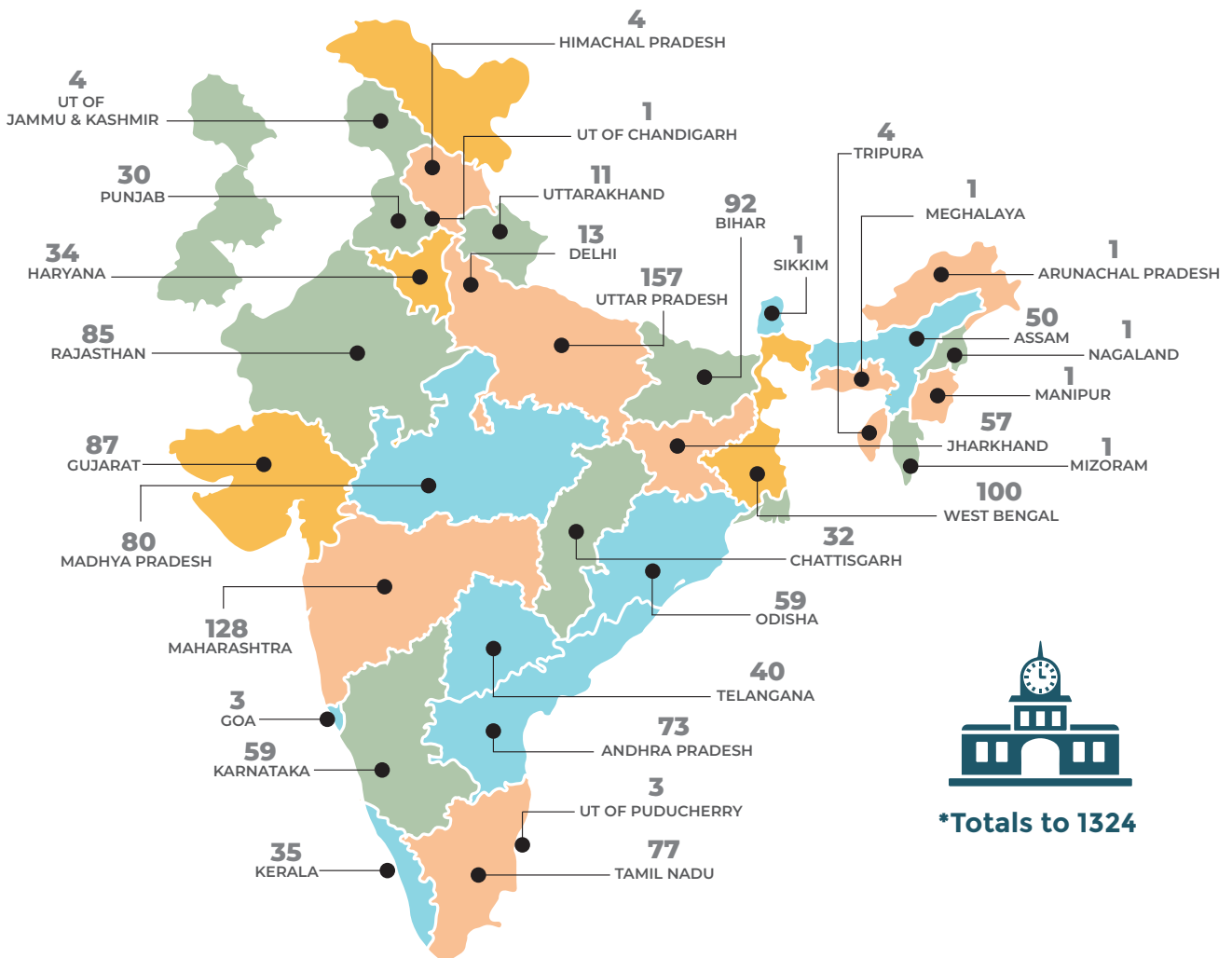
Segregated arrivals and departures

In the redevelopment of Secunderabad Railway Station, a key challenge was managing high passenger footfall while improving circulation and efficiency, and reducing congestion.

Secunderabad is one of India's busiest railway stations, serving as a critical junction in South India with a mix of long-distance, suburban and intercity trains. So, Sthapati, the architectural firm designing and building the redeveloped station,

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Number of Amrit Bharat Stations across States



introduced an elevated concourse for departures, accessible via escalators, elevators and staircases. The lower concourse facilitates arrivals. "This design enhances safety and streamlines operations, similar to how modern airports function," elaborates Varshneya. "Introducing a two-level concourse represents a major shift in how Indian railway stations are being reimagined – moving towards efficient, high-capacity and

passenger-friendly transit hubs that are future-ready while integrating sustainable and technology-driven solutions."

The segregation of arrivals and departures is also a feature of the Tirupati and Yesvantpur redeveloped station designs. In Tirupati, three new platforms were added to cope with the expected doubling of footfalls over the coming decades, shares Prakhar, alongside segregating the arrival

and departure areas to avoid conflicts in passenger movement and creating an expansive waiting zone above the tracks.

In Yesvantpur, "a new concourse over the tracks connects the east and west station buildings, improving connectivity and streamlining circulation," adds Prakhar. "Arrival zones on both sides of the tracks enable the smooth and seamless exit of arriving passengers. The departure building comprises

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Habibganj (Rani Kamalapati) Railway Station in Bhopal features commercial spaces, food courts, and premium lounges.

ticketing areas and waiting halls for different categories of passengers.”

Sustainability matters

Sustainability, one of the key guidelines for the redevelopment of railway stations, is being worked into stations through renewable energy, water conservation techniques and green building materials and design.

To become self-sufficient in its power needs and contribute to the national solar power targets, Indian Railways has successfully solarised over 960 stations, such as Varanasi, New Delhi, Old Delhi, Jaipur, Secunderabad, Kolkata, Guwahati, Hyderabad and Howrah, and placed orders for a 198 mw solar rooftop capacity across 550 stations, which are currently under development, shares **Saurav Choudhury, Counsellor - Green Built Environment, Architect & Urban Planner, CII-IGBC.** “Solar plants with a total capacity of 20 gw are proposed to be installed on vacant land by 2030.”

Wind turbines have been installed in Jaisalmer, Tamil Nadu and Sangli. The next couple of years will see 200 mw of wind energy plants being installed in Tamil Nadu, Gujarat, Rajasthan and Karnataka.



Redevelopment projects such as the Andheri and Secunderabad railway station projects incorporate solar panels, rainwater harvesting and green landscapes, Varshneya tells us. “Both the Andheri and Secunderabad stations are GRIHA-certified.”

Passive design principles, such as natural ventilation, passive cooling and optimal orientation, will enhance comfort in Lucknow’s Gomti Nagar’s Railway Station while minimising energy consumption, says Kukreja. The redevelopment of Lucknow’s Gomti Nagar Railway Station includes a south-side terminal upgrade, a newly constructed north-side terminal, enhanced railway platforms, and expanded vehicular access and parking facilities. “Smart design strategies, including BMS-enabled resource management, green paving and landscaped gardens, further enhance sustainability and improve operational efficiency.”

Passive lighting design strategies, such as the use of

glazed façades, reduce dependency on artificial lighting and improve commuter comfort, adds Varshneya. “Incorporating green landscapes in and around the station helps mitigate heat and improve air quality.”

CP Kukreja Architects assesses sustainability metrics to ensure that materials, spatial planning, and energy-efficient solutions align with long-term environmental goals. Smart technologies further support a holistic and future-ready approach to station redevelopment.

According to Chaabra, supervisory control and data acquisition (SCADA) and BMS will support sustainability in upgraded railway stations by enabling real-time monitoring and management of various systems. Egis design teams are deployed in the Rail Land Development Authority office to support the design and review of various station development projects. With an EcoVadis Gold sustainability rating, Egis is recognised as

COVER STORY

a global leader in sustainable rail infrastructure.

Assessing greenness

With the support of the Environment Management Directorate of Indian Railways, the CII-Indian Green Building Council for Indian Railways developed and launched the Green Railway Stations Rating System in 2016 to address the impact of the design, construction, operation and maintenance of railway stations on the environment, especially health, hygiene, sanitation, energy and waste management, and commuter experience.

"A rating can deliver, at the most, a 40 per cent decline in the consumption of electricity and a 30 per cent decline in the water consumed in stations," says Choudhury. In that context, an annual saving of 22 million kWh of electricity and 3 billion litre of water was logged in the first 30 railway



"Project leaders often face multiple logistical challenges, including but not limited to, project timelines, budgets and supply chain disruptions."

- Rajeev Bansode, Assistant Vice President, Ahluwalia Contracts (India)

stations to become green, translating into a ₹40 crore cost reduction. Further, improved first and last-mile accessibility, better ventilation, safety and access for the differently abled and the elderly are some benefits to commuters from green stations.

Considering that each of India's 425 non-suburban group (NSG 1-4) railway stations logs about 1,500 tonne of carbon emissions

annually, Choudhury says the total potential to reduce carbon emissions is substantial.

CII is working with more than 100 railway stations and has facilitated 41 railway stations to achieve the Green Railway Stations Rating so far. Railway stations in Coimbatore, Secunderabad, Asansol, Jaipur and Visakhapatnam have achieved Platinum rating.

Material palette

The choice of materials for the different components of the station is driven primarily by safety, durability and compliance with Indian Railways' specifications, according to **Khoobi Mehta, Executive Director, Girdhari Lal Constructions**. "Every material used in the construction of a development project must be approved by Indian Railways, to ensure it meets the rigorous standards set by the authority."


The push for sustainability



Gomti Nagar Railway Station blends Awadhi heritage with contemporary arches and curvilinear roofs, complementing its historic surroundings.

Photo courtesy: Gomti Nagar Railway Board

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Station designs are evolving towards pre-engineered structures, high-strength steel and precast concrete.

Photo courtesy: MTR/Railway Board

and faster construction has influenced these material choices. "Materials like recycled steel, low thermal concrete and perforated concrete screens are being adopted to enhance durability while reducing environmental impact," says Kukreja.

In Naya Raipur, the material palette included glass fibre-reinforced concrete panels and perforated façades for shading, says Shah, while also citing high albedo coatings, which help to minimise heat gain, and skylights, clerestory windows and shading devices, which help to reduce artificial lighting and cooling loads.

According to him, evolving station designs will likely see a dominance of pre-engineered structures, where materials such as high-strength steel, precast concrete and laminated timber will become preferred choices owing to faster construction timelines. "Pre-engineered structures are best suited for terminal-style mega stations, akin to airport-like terminals, with expansive, unobstructed concourses, retail areas and modern lounges, which we're seeing more of. Pre-engineered structures with large-span steel trusses and tensile roofing, creating column-free, airy spaces, was our choice for Naya Raipur (and similar stations)."

Sthapati also opted for a pre-



"For the Ayodhya Dham Junction, materials were intentionally gathered from various states, so that the station embodied the unity and diversity of India."

- Shashank Gupta, Managing Director, N S Associates

engineered building structure in Secunderabad for faster construction and modular adaptability.

Further, Shah says steel and glass will play a key role in creating wide-span structures with maximum daylight penetration; precast concrete and glass fibre-reinforced concrete panels will help speed up construction and improve durability; tensile fabrics and ethylene tetrafluoroethylene (ETFE) membranes roofing will allow diffused natural light and reduce energy consumption; and locally sourced stone and bamboo will bring in a regional identity while lowering the carbon footprint.

He also sees scope for self-cleaning façades made of anti-smog tiles and kinetic paving (which generates energy through footfall) to play a role in next-

generation stations.

Preserving heritage

Contextual design has emerged as a buzzword across station redevelopment projects, in the light of the Amrit Bharat Station Scheme guidelines encouraging the conservation of heritage.

"Contextual design ensures that the transformation reflects the local architectural heritage and cultural identity," explains Varshneya. "Rather than imposing modernisation for the sake of change, the idea is to prioritise architectural continuity, ensuring that stations evolve as contemporary transport hubs while remaining deeply rooted in their local identity."

By thoughtfully blending heritage and modernising it, railway stations can serve as cultural landmarks that honour their surroundings while embracing progress.

For example, Sthapati's design for the Bangalore Cantonment station is inspired by the city's Garden City moniker. The station incorporates floral motifs within its supporting columns, while the façade subtly references Karnataka's musical heritage by including elements resembling the sitar.

Lucknow's Gomti Nagar Railway Station's design incorporates traditional Awadhi

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Photo courtesy: N S Associates

Supervisory control and data acquisition (SCADA) and BMS enables real-time monitoring and management of various systems

architectural elements, such as contemporary arches and curvilinear roofs, harmonising the station with its historic surroundings, shares Kukreja.

“Tirupati station’s iconic form is inspired by the grandeur of Dravidian temple architecture to resonate with the identity of the place and make it more than just a transit hub – a gateway that welcomes millions every year,” says Prakhar.

Baleswar Station in Odisha is designed on the theme of the Jagannath Temple; Sikkim’s Rangpur will carry the imprint of local architecture; Sangner Station in Rajasthan displays 16th-century hand-block printing; the station at Kumbakonam in Tamil Nadu will display the Chola influence; Ahmedabad Station is inspired by the Modhera Surya Mandir; and Dwarka Station is inspired by the Dwarkadheesh Temple.

Conserving heritage also takes the form of using local materials. For example, Rajasthan’s stations

may integrate jaali screens inspired by havelis, while Kerala’s may feature sloping roofs inspired by Nalukettu houses, and those in Bengal could use terracotta cladding or motifs referencing colonial heritage, says Shah. “In Naya Raipur, we considered elements that evoke Chhattisgarh’s heritage – subtle motifs from tribal art, local stone textures, laterite stone cladding and a façade treatment that blends tradition with modernity.”

In Ayodhya, the transformation of the junction was much more than a functional upgrade to strengthen the railway infrastructure in anticipation of the growing influx of pilgrims and tourists. It aimed at honouring the city’s spiritual and cultural legacy, to ensure that the station reflects its enduring historical and religious significance. To this end, Shashank Gupta, Managing Director, N S Associates, which was entrusted with the Ayodhya Dham Junction, says, “Careful consideration was given to the materials used in construction.

Bansi Paharpur stone, the same stone used to construct the Ram Mandir, was chosen for its symbolic importance. Calcium silicate tiles were sourced from Bengaluru, while the high volume, low-speed fan installed in the station’s central section was procured from Gujarat. Materials were intentionally gathered from various states, so that the station embodied the unity and diversity of India.”

Bidding pitfalls

Bidding for station redevelopment projects is competitive business, especially, as Varshneya says, in the light of greater globalisation.

“A bidder must understand the urban vision,” emphasises Shah. For instance, Naya Raipur is a planned smart city and, so, the Creative Group’s focus was on integrating the station with multimodal transport, ensuring that it aligns with the city’s master plan.

“A bidder must also lay stress on design innovation, proposing a futuristic design that is sustainable through climate-responsive architecture, and economic viability through revenue models such as commercial leasing, hospitality integration and transit retail,” he continues. A case in point is Gandhinagar Railway Station, redeveloped under a PPP model with a five-star hotel built above the station, a landmark in transit-based hospitality.

Collaboration is a vital skill for a bidding firm, especially in projects where the scope demands skills beyond the firm’s specialisation. Varshneya cites the example of the Secunderabad station redevelopment project, a design-and-build approach. Unlike design-focused station redevelopment projects,

COVER STORY

Amrit Bharat Station Scheme



Dilip Kumar

The Amrit Bharat Station Scheme aims at improving amenities at stations, such as station access, circulating areas, waiting halls, toilets, lifts/escalators as necessary, cleanliness, free Wi-Fi, kiosks for local products through schemes like 'One Station One Product', better passenger information systems, executive lounges, nominated spaces for business meetings, landscaping, and so on, keeping in view the necessity at each station, says Dilip Kumar, Executive Director (Information & Publicity), Railway

Board. "The scheme also envisages improvement of building, integrating the station with both sides of the city, multimodal integration, amenities for Divyangjans, sustainable and environment-friendly solutions, provision of ballast-less tracks, 'Roof Plazas' as per necessity, phasing and feasibility and creation of city centres at the station in the long term."



"Mixed-use development reduces dependency on standalone transport functions and encourages economic activity."

- Dikshu Kukreja, Managing Principal, CP Kukreja Architects

Secunderabad needed "strong construction partners understanding the complexities of executing large-scale infrastructure projects in a brownfield environment. Our design team collaborates closely with our construction partners, going the extra mile to bring these ambitious projects to life."

Coordinating with multiple stakeholders such as railway authorities, urban development bodies and private investors can present challenges, cautions Shah. "Other challenges associated with bid projects are land acquisition and zoning regulations that impact station expansion and mixed-use

integration, balancing heritage conservation with modern needs, and financing and PPP models."

Another challenge encountered by contractors bidding for projects across various railway departments is variations in criteria for similar works, according to Mehta. "In some cases, tender documents have contained inconsistencies or lacked detailed drawings at the time of bidding, leading to differing interpretations. The availability of only basic drawings often necessitates assumptions, which can sometimes result in significant variations in bidding amounts between L1 and L2."

Mehta suggests allowing drafting agencies more time and authority to develop comprehensive tenders that clearly outline project requirements and structural considerations. In EPC contracts, she notes, "engineering is sometimes conflated with design. Modifications in scope, tender drawings or requirements can lead to project delays, increase the likelihood of execution errors, necessitate rework and impact resource efficiency. The

unavailability of old drawings and plans, especially for electrical cables and services complicates the execution."

Mehta also observes that while "setting high standards for the pre-qualification criteria ensures that the work is awarded to an experienced agency, if the specification is too narrow, it limits competition and defeats the purpose of tendering, that is, the optimal allocation of public funds."



"SCADA and BMS will support sustainability in upgraded railway stations by

enabling real-time monitoring and management of various systems."

- Rajesh Chaabra, Executive Director, Transportation, Egis South Asia

At the end of the day, bidding can be both an insightful and transformative experience for all those involved in the process, which can help them deliver better to the nation. "Bidding has deepened our understanding of the nuanced needs of rail infrastructure—balancing operational efficiency with the evolving expectations of modern travellers," says Prakhar. "It has also reinforced the potential of railway land as a catalyst for urban growth, where thoughtful integration of commercial and public spaces can drive long-term value."

Implementation challenges

Design and execution complexities are among the biggest challenges in implementing railway station projects, says Mehta of

COVER STORY



Photo courtesy: N S Associates

Ayodhya Junction's transformation goes beyond infrastructure, preparing for a growing wave of pilgrims and tourists.

Girdhari Lal Constructions, which is implementing the railway station redevelopments in Nagpur, Secunderabad, Yesvantpur (Bengaluru), Surat and Jaipur.

Rajeev Bansode, Assistant Vice President, Ahluwalia Contracts (India) Ltd, a veteran of the construction industry, has personally worked on airport and stadium projects but redeveloping an operational railway station is, in his words, "something else altogether insofar as a construction project is concerned", essentially because "railway operations can't be fully halted".

"Working within live railway environments necessitates clearances from authorities, which, in turn, requires careful coordination with local authorities and Indian Railways," says Mehta. "Since the approval process is aligned with the Railways' effort to

minimise disruptions to passengers, we have faced delays in getting approvals for site access and partial permissions for work areas, which have affected our ability to proceed as planned. Occupied areas around the stations are often congested or not cleared for work, which delays getting clear and uninterrupted access to the construction sites."

Clearances to start work come as block permissions. Thereafter, the contractor must follow every applicable safety protocol. "The focus must be to de-electrify the overhead equipment before each block, and take precautions to ensure the safety of passengers and crew, keeping in mind the Railway Safety Board Guidelines," says Bansode.

In Ayodhya, N S Associates effectively addressed this challenge by "strategically installing height barricades and overhead platforms,

optimised to meet operational needs," says Gupta. "A dedicated team of marshals was deployed to maintain a constant, vigilant presence, ensuring the smooth and uninterrupted movement of scheduled trains."

N S Associates "experienced collaborative authorities, who, along with the RITES team, navigated the complexities with utmost efficiency, ensuring that clearances and permits were never roadblocks, and were processed without any hindrance," he adds.

Further, since the blocks are of a finite time, for few hours to, say, 10 days, multiple teams and additional equipment must be deployed to work through the allotted time, adds Bansode.

"Implementing night shifts and phased construction are vital to minimise disruptions to the movement of passengers and train

COVER STORY



Photo courtesy: CII

To become self sufficient in its power needs and contribute to the national solar power targets, Indian Railways has solarised 960 stations.

operations," says Mehta.

In redeveloping the Chandigarh railway station, which has a daily footfall of 35,000 to 40,000 passengers, Ahluwalia Contractors (India) has deployed two 80-m radius, 64-tonne capacity tower cranes designed to position materials on the hard-to-access middle platform, bogie flat rail-carrying wagons to transport steel and other heavy materials, tough riders and mini excavators and material handlers to work in restricted spaces, and 400-500 m pipelines to place concrete.

The Chandigarh station redevelopment involves the restoration of the existing station buildings, revamping of the platforms and the construction of a building on the other side of the tracks, a concourse with a span of 80 m by 72 m over the tracks to connect the buildings, two foot overbridges connecting the Chandigarh and Panchkula Ends to

the platforms, a parking area on each side, sewage treatment plants and a plant room. A roof with a span of 180 m by 80 m will cover the concourse, the platforms and the two foot overbridges.

"Managing logistics in such high-impact projects requires strategic planning along with effective and efficient communication with stakeholders," says Bansode. "Project leaders often face multiple logistical challenges including, but not limited to, project timelines, budgets and supply chain disruptions."

What stands out is that projects of such scale have never been taken up before in India, and so, according to him, no contractor has prior experience to anticipate the logistical challenges that would arise during their implementation. Chandigarh, a 'lighthouse' railway station redevelopment project, has helped bring the logistical challenges to the attention of

other contractors.

Then, before starting any fabrication, designs must be validated; this requires legal provisions to be interpreted, to ensure that the regulatory requirements of the Research Designs and Standards Organisation are strictly adhered to, adds Bansode.

Solutions to assist

At Ahluwalia Contractors (India), BIM, Tekla and ETABS solutions have helped streamline the precise resource planning essential for project execution.

Girdhari Lal Constructions is using BIM to create detailed, data-rich digital representations of the railway stations, including both the physical and functional characteristics, says Mehta.

At N S Associates, an ERP system integrates every stage of the construction process, offering real-time progress tracking at a glance, shares Gupta. "During the pandemic, this ERP system became seminal in supporting remote work, enabling staff to monitor site requirements, place orders, and access progress charts and drawings effortlessly. Collaborative discussions were streamlined and we further enhanced functionality by utilising Google tools like Sheets for data management and BIM software for comprehensive project oversight."

Truly, station redevelopment is a challenging yet exciting frontier of urban infrastructure – one that will touch the lives of millions of Indians.

- CHARU BAHRI | CW |

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